dry weather flow of sewage is, perhaps, a usual capacity provided"), affords such uncertain guidance upon important details of works design.

Neither practical nor scientific value can be attached to Table XV, "Showing the dimensions of several septic tanks in use in England," or to the bald statement that circular tanks of the Dortmund type are in use, as septic tanks, in the absence of comment as to the suitability of the design to the object in view. The comparison between contact and percolating filters is carefully, and on the whole fairly, drawn, although it is not quite clear whether the working costs quoted are strictly comparable.

Assumption of the colloidal form is so characteristic a property of fæcal matter that the author's belief that the colloidal matter of sewage is derived in great measure from soap would seem to require some definite experimental support or reconsideration.

The book is well indexed, and is provided with a useful bibliography. PERCY GAUNT.

THE PRODUCTION OF NEW VARIETIES OF PLANTS.

Fundamentals of Plant-Breeding. By Dr. J. M. Coulter. Pp. xiv + 347. (New York: D. Appleton and Co., 1914.) Price 6*s*. net.

PROF. COULTER is entering the ranks of the writers of books on scientific subjects, as he already has a place amongst those who produce scientific books. In the volume before us he has certainly achieved a considerable measure of success in making difficult matters fairly easy of comprehension by any ordinarily intelligent person. The carping critic may perhaps object that the dose of science is sometimes contained in too abundant a vehicle of padding, but at least he will scarcely allege that the padding itself is totally devoid of flavour.

The author has skimmed over many difficult and debatable matters with a freshness and vigour of expression which makes his book a pleasant one to read, and he has contrived to weave into the text a very considerable amount of theory and fact. Even those who are tolerably familiar with the work of plant breeding will probably find much that is of interest in what we might perhaps describe as the more remotely relevant matter. The book is, of course, written from the American viewpoint, but it is good that people in this country should have brought forcibly to their notice the supremely important problems that underlie so much of scientific agriculture, in which an immense amount of capital is invested. The Americans take these problems seriously, and the people are interested in the results which mean so much to the country, for it is from the soil and its living products that the permanent sources of wealth of a community must, after all, largely depend.

Prof. Coulter deals with the various methods of raising new and valuable plants, of conserving what has been obtained by the application of rational, and therefore truly scientific, principles which enable disease to be successfully fought, and by which further improvements are to be secured. He also deals with the more outlying topics of forestry, the soil, search for new plants, the work of experimental stations, and so on, and he may be congratulated on the production of an interesting, instructive, and readable volume.

We note a few points in connection with which a future edition will, perhaps, afford an occasion for modification. The lettering of the figures on p. 11 is omitted; and surely Figs. 15 and 16 should not be quoted from the text-book of which Prof. Coulter is joint-author, but from the original source, *i.e.* from Bonnier's admirable paper on the effects of habitat on plant structure. Exception might well be taken to the illustration on p. 5 of fluctuating and constant variation, on the ground that the potato tubers quoted are the result of vegetative, and not of sexual, reproduction, and the illustration itself also strikes one as having an air of unreality about it. A serious misapprehension of Weismann's position would probably be gathered by the uninstructed reader of p. 68, on which it is briefly stated that "Weismann thought that all the characters of both parents are represented by ids in the fertilised egg. This was the necessary antecedent to 'amphimixis.' Mendel, on the other hand, showed that characters are segregated in the reproductive cells." Weismann would certainly have repudiated the justice of the contrast in this form. But, despite slips such as these, the book is a good one.

OUR BOOKSHELF.

The Earth: Its Life and Death. By Prof A. Berget. Translated by E. W. Barlow. Pp. xi + 371. (New York and London: G. P. Putnam's Sons, 1915.) Price 7*s*. 6*d*. net.

PROF. BERGET has written in popular terms a physical history of the earth. He has endeavoured to discern the mode of its origin and to estimate its age, to describe the phenomena of the present living globe, and finally to forecast the manner of its death. He has certainly succeeded in rendering many difficult lines of reasoning clear and intelligible to the general reader. The book is in no part dull, and would not read like a translation were it not that English equivalents

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are added after all measurements in metres or in centigrade degrees. Besides the translator's interpolations, an unnamed editor has inserted in the text many notes which would have appeared more appropriately at the foot of the page. As these notes are on astronomical points only, they leave the impression that other subjects stand in similar need of amendment, and there can be no doubt that this is the case in more than one chapter.

Sometimes the author writes with a little too much confidence. He treats a theory almost as if it were a scientific fact. For instance, he refers to the contraction theory of mountain-formation as though its foundation were secure. He accepts as proven an eleven-year period of earthquake-frequency and the increased frequency of earthquakes at the times of the equinoxes.

While reading the book, it is difficult to resist the impression that the author does not always trust to original authorities. This impression is perhaps strongest in the chapter on seismic phenomena, in which, though the original text must have been written in or after 1909 (see p. 208), many facts are omitted which should have found a place. Indeed, in this chapter of thirty-eight pages, the name and work of Milne are never once mentioned.

A Map of the Western War Area. Edited by Prof. A. J. Herbertson. 60 in. × 60 in. (Oxford: The Clarendon Press.) Price, mounted in sections, with names 15*s*., without names 12*s*. 6*d*.

THIS useful and striking map depicts the country from the Seine to the Rhine, and from the Swiss frontier to the Rhine delta, on a scale of eight miles to 1 in. (1 : 500,000). It is provided with contour lines and layered colouring, and shows vividly the interdependence of land relief and military strategy. It is issued in several forms—unmounted, mounted in sections, and mounted on rollers, varnished or unvarnished, at prices varying from 10*s*. 6*d*. to 17*s*. 6*d*. Produced under the supervision of Prof. Herbertson, it provides an excellent and trustworthy companion for the student of current events in France.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

A Canadian Memorial to Hugh Miller.

IN a letter which I have just received from Dr. John M. Clarke, director of the State Museum at Albany, N.Y., he writes:—"You may be interested to know that at my urgent suggestion the Geographic Board of the Province of Quebec have adopted the name 'Hugh Miller Cliffs' for the wonderful Old Red Sandstone fish-beds which line Scaumenac Bay on the Bay Chaleur, near the Gulf of St. Lawrence. I think there is no place in the world where the fishes Hugh Miller described are so abundant. It is a little odd that the devout French Catholics of P. Quebec should consent to this naming of their scenery after a Scotch Presbyterian, but the cliffs look across the bay from French Quebec to Scotch New Brunswick!"

Geologists in this country will be pleased to hear of this Transatlantic recognition of Miller's pioneer work, and they will feel that Dr. Clarke, who is familiar with the classic Cromarty ground, as well as with that of Scaumenac Bay, deserves our thanks for suggesting this unusual but most appropriate memorial, and for his successful efforts to have it carried out.

ARCH. GEIKIE.

Shepherds' Down, Haslemere, June 24.

The "Green Fluorescence" of X-Ray Tubes.

THE Glass Research Committee of the Institute of Chemistry has recently issued a note on the conditions for obtaining green fluorescence under kathode rays in glass suitable for X-ray tubes indicating that the presence of a small amount of manganese must be present. In view of the fact that there appears to be some misconception regarding the necessity of the green fluorescence it may be of interest to give a brief account of what is involved in obtaining as marked a fluorescence as that which has usually been noticed in working X-ray tubes hitherto.

So far as I am aware the advantage of the green fluorescence is that it provides the X-ray operator with a convenient rough indication of the "hardness" of the tube. It is scarcely necessary to point out that the quality of the X-rays is in no way influenced by the nature of the fluorescence of the glass. Experiment has shown that a strong green fluorescence can only be obtained at some sacrifice of the excellence of the glass. Glass manufacturers frequently add manganese dioxide to a glass mixture to correct the green colour due to iron which is invariably present to some extent in the ingredients used, and, of course, the more iron there is as an impurity the more must be the amount of manganese dioxide added. Thus in some cases, in order to obtain the full green fluorescence, an appreciable quantity of iron must be added to relatively pure ingredients so that the necessary quantity of manganese may be incorporated in the glass, the iron being needed to correct the amethyst colour which so much manganese would otherwise impart to the glass.

This procedure appears to impair the working qualities of the glass to some extent, and it is found that glass of a quality superior (in respect to its behaviour in the flame) to that usually employed can be made if iron and manganese are avoided. A few experiments may be mentioned in support of this statement.

Glass made from pure materials shows practically no fluorescence, the feeble glow being of a grey-blue colour. A Rupert's drop made from the same glass gives a similar feeble glow.

A Rupert's drop made from glass giving normally a strong green fluorescence shows only a slight grey-blue glow. After the tail of the drop had been heated to softening point this part showed the usual green glow. In a high vacuum under very intense bombardment there was an indication of some slight green glow on the drop. The drop was broken and the powdered glass gave the full green glow. The evidence was that only a very thin skin represented the part cooled quickly enough to give next to no fluorescence.

Calcium silicates of varying composition containing a little manganese, which were fused by the oxy-hydrogen blowpipe, showed on the outside portions, which appeared to be completely vitreous, no

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